



OPS830 Series
Intel® Open Pluggable Specification Box
User's Manual



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Safety Approvals

- ◆ CE Marking
- ◆ FCC Class A

◆ FCC Compliance

This equipment has been tested in compliance with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are meant to provide reasonable protection against harmful interference in a residential installation. If not installed and used in accordance with proper instructions, this equipment might generate or radiate radio frequency energy and cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following methods:

1. Increase the separation between the equipment and receiver.
 2. Connect the equipment to another outlet of a circuit that doesn't connect with the receiver.
 3. Consult the dealer or an experienced radio/TV technician for help.
- Shielded interface cables must be used in order to comply with the emission limits.

Safety Precautions

Before getting started, please read the following important safety precautions.

1. The OPS830 does not come equipped with an operating system. An operating system must be loaded first before installing any software into the computer.
2. Be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
3. Disconnect the power cord from the OPS830 before any installation. Be sure both the system and external devices are turned OFF. A sudden surge of power could ruin sensitive components that the OPS830 must be properly grounded.
4. Make sure it is the correct voltage of the power source before connecting the equipment to the power outlet.
5. The brightness of the flat panel display will be getting weaker as a result of frequent usage. However, the operating period varies depending on the application environment.
6. The flat panel display is not susceptible to shock or vibration. When assembling the OPS830, make sure it is securely installed.
7. Do not leave this equipment in an uncontrolled environment where the storage temperature is below 0°C or above 40°C. It may damage the equipment.
8. External equipment intended for connection to signal input/out or other connectors shall comply with relevant UL/IEC standard.
9. Do not open the back cover of the system. If opening the cover for maintenance is a must, only a trained technician is allowed to do so. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:
 - Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help to discharge any static electricity on your body.
 - When handling boards and components, wear a wrist-grounding strap, available from most electronic component stores.

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CHAPTER 1 INTRODUCTION

This chapter contains general information and detailed specifications of the OPS830 Chapter 1 includes the following sections:

- General Description
- Specification
- Dimensions
- I/O Outlets
- Package List

1.1 General Description

Intel® Open Pluggable Specification (OPS) Compliance

OPS830 is based on the Intel® Atom™ D2550/N2800 processor with Mobile Intel® NM10 Express chipset. The Pluggable Module is targeted to provide an interchangeable solution to the digital signage media players with compatible connector. This document provides the module form factor, connector specification, reference thermal solution, and boundary conditions in order to ensure the functionality of the module in all compatible display panel system.

OPS830 meets Intel® Open Pluggable Specification for design and development, simplifying system upgrade maintenance for manufacturers and developers that supports not only is high flexible and user-friendly digital signage applications, also significantly provides superb graphics performance, full HD content playback.

Easy maintenance

OPS830 offers a best solution for digital signage market. Compliant with Intel OPS architecture, digital signage players are capable of deploying interchangeable systems faster and easing upgrading/maintenance, while lowering costs for development and implementation. Additionally, having the ability to simply slot-in and out the unique pluggable engine box makes daily hassle easier and faster for users.

OPS830 has pluggable engine box design; you can change HDD, DRAM and configurations more easily

1.2 System Specifications

1.2.1 Main CPU Board

- CPU
 - Intel® Atom™ D2550/N2800 processor on board..
- System Chipset
 - Intel® NM10
- BIOS
 - AMI® BIOS
- System Memory
 - One socket 204-pin DDR3 SODIMM system memory up to 4GB
- Wireless Module
 - Optional IEEE802.11 a/b/g/n, Bluetooth 2.0

Remark: *Suggest disable Aero Peek function, the following route under OS Win 7 is*

Start/Control panel/System and Security/System/Enable Aero Peek

1.2.2 I/O System

- Standard I/O
 - One VGA
 - Two USB ports 2.0
 - One Power on /Off button
 - One Reset button
- Ethernet
 - 10/100/1000Mbps Ethernet
- Audio
 - Line-out/ Mic-in
- Expansion
 - One PCI Express Mini Card slot is equipped for optional add-on such as wireless LAN card for 802.11 a/b/g/n connections, GPS, Bluetooth application.
- Storage
 - One 2.5" SATA HDD tray
- Net Weight
 - 0.9Kg(1.99 lb) without cooler
- Dimension (Main Body Size)
 - 200 mm(W)x 119 mm(D) x 30 mm(H)
- Operation Temperature
 - 0°C to 45°C with airflow 0.7 m/s, OPS compliant



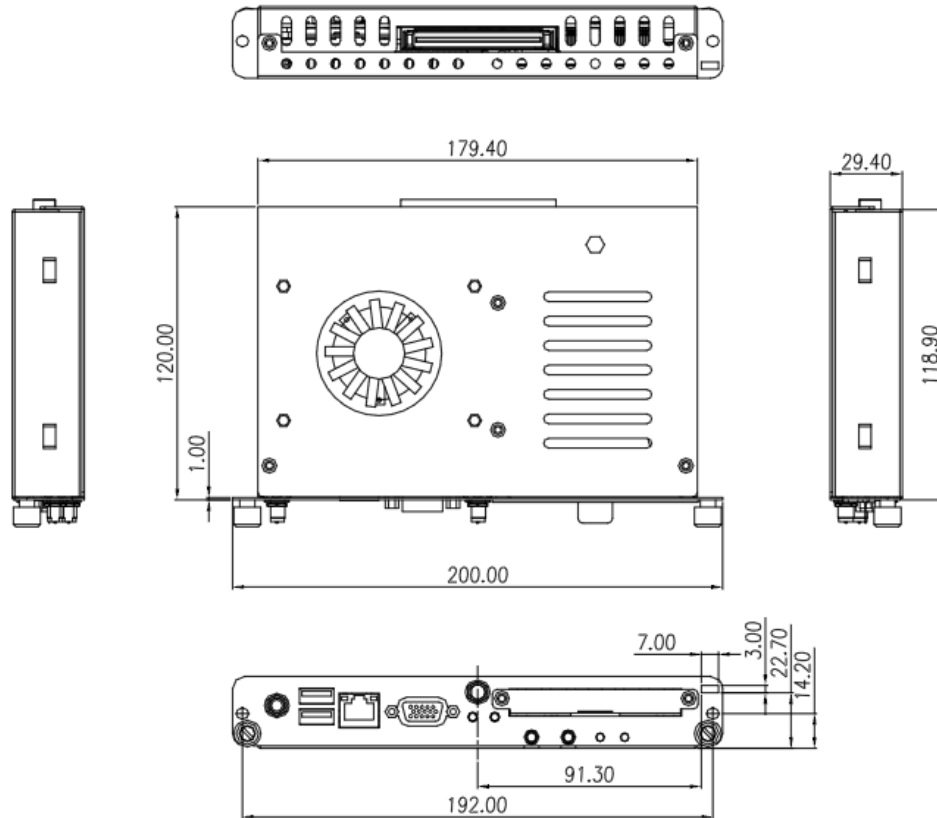
NOTE: *All specifications and images are subject to change without notice.*

1.3 Mechanical Assembly

1.3.1 Dimensions

This diagram shows you dimensions and outlines of the OPS830

The overall dimension of the module including the mounting frame is 200mm x 119mm x 30mm and also shows the location of the front panel screw holes as well as the security lock.



Remark: While plugging the OPS module, please make sure the heat sink side of OPS module. Toward the outside, Axiomtek will be out of reasonability if there is any damage occurred due to it.

1.3.2 I/O out let

The following figures show you the locations of the OPS830 I/O outlets.



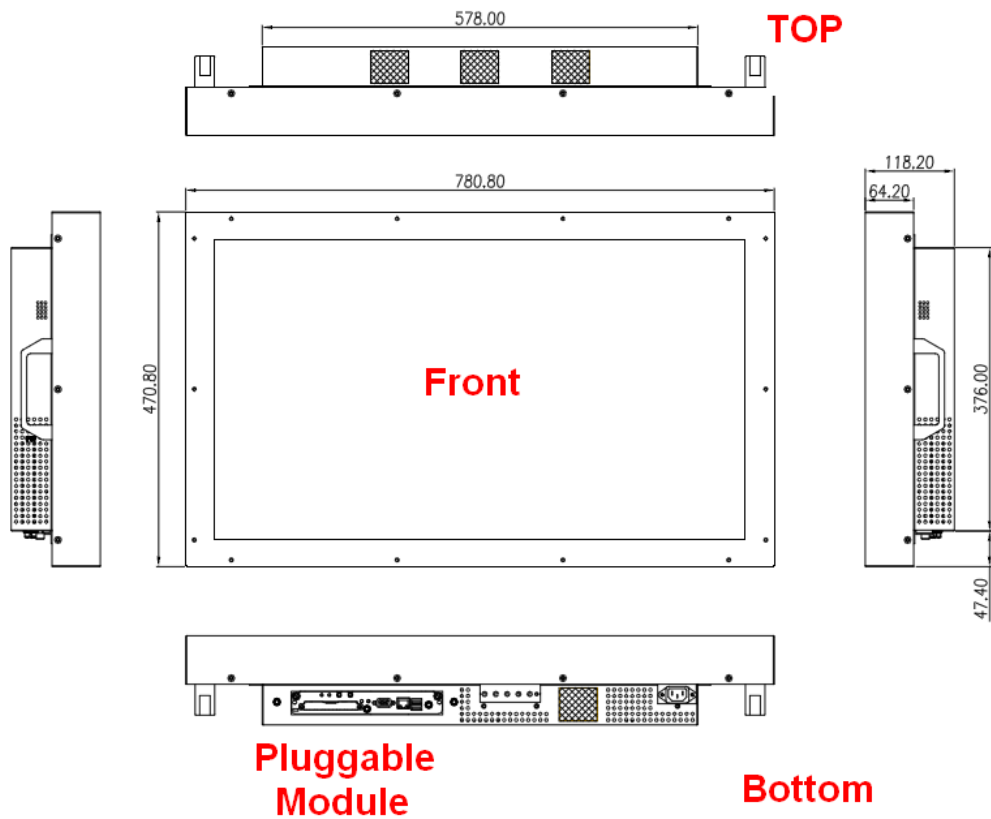
No.	Connector	No.	Connector
1	2.5"HDD slot	7	Audio(Line-out)
2	USB 2.0 x2	8	Audio(Mic.-in)
3	Ethernet	9	Power indicator
4	VGA	10	HDD indicator
5	Power Switch	11	JAE TX-25
6	Reset	12	Optional Antenna

1.3.3 Mechanical Specifications

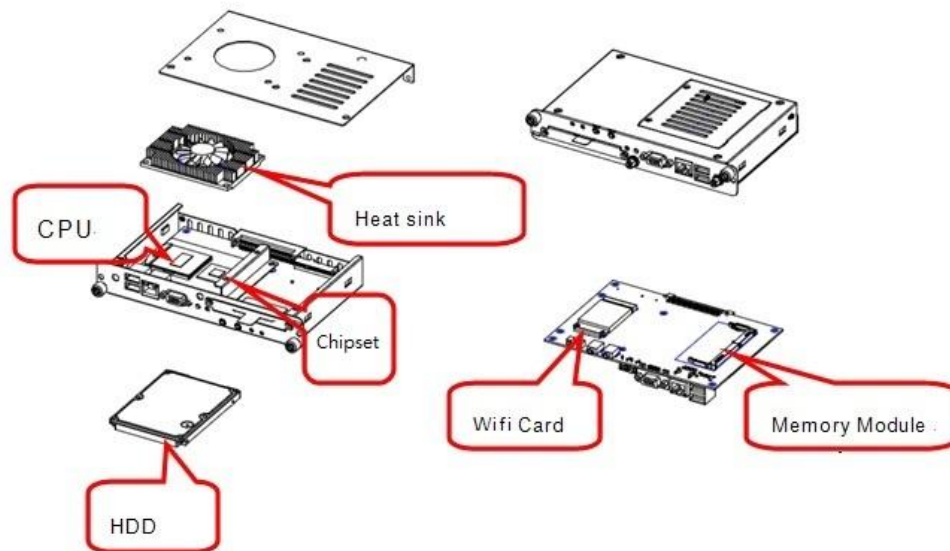
- OPS830 Docked in the Reference Display Panel
The OPS 830 Pluggable Module docked at a display panel system.
In this reference design, the module is docked and undocked in the vertical direction.



NOTE: Please contact Axiomtek for available option display panel.

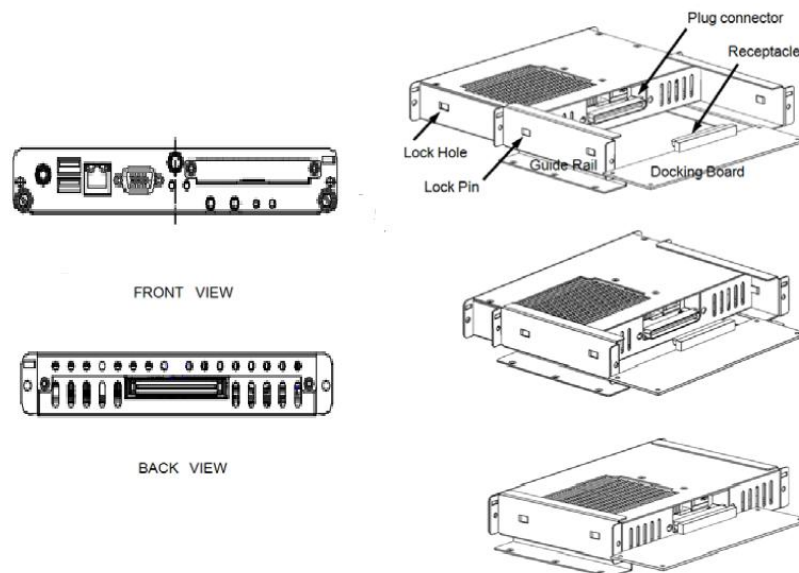


➤ Exploded View of the Pluggable Module

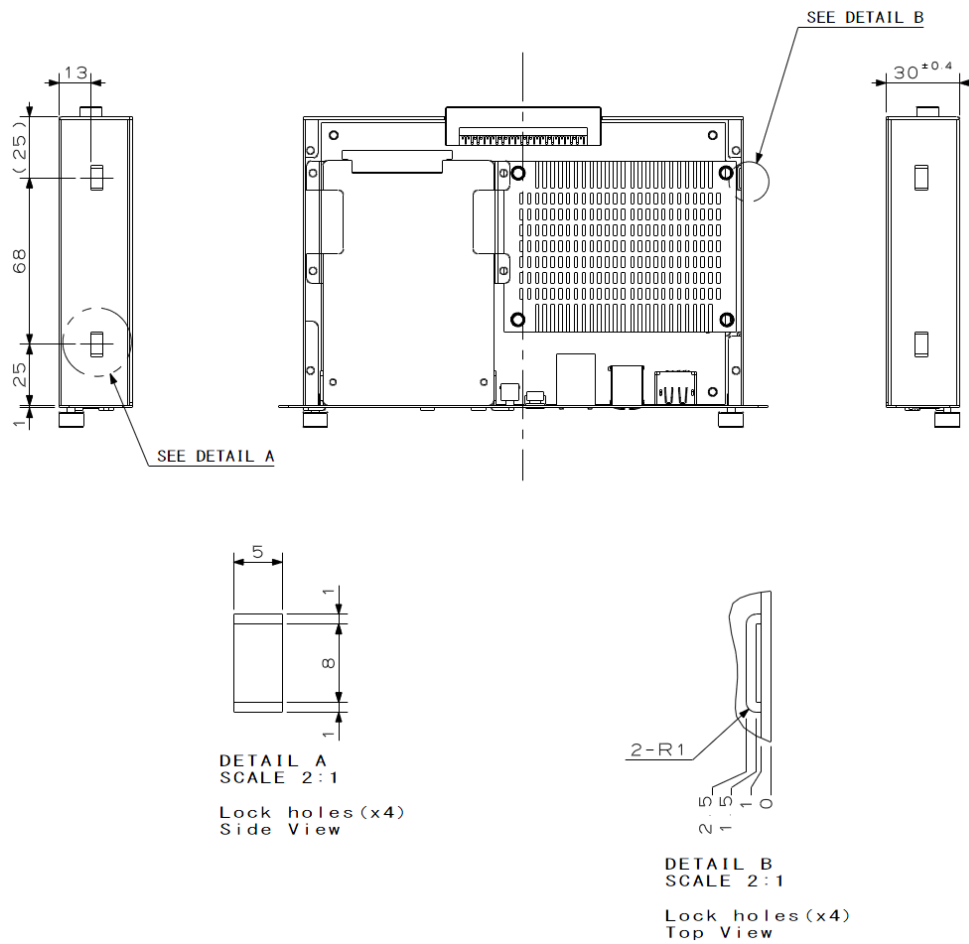


➤ The Guide Rail Mechanism for the OPS830 Module

You can use the rails along side of OPS830 module to dock and undock the plug connector at the back of the module to connect with docking board. There are two lock pins on each side of the rail which serve as the locking mechanism to attach the lock holes on the OPS830 module.

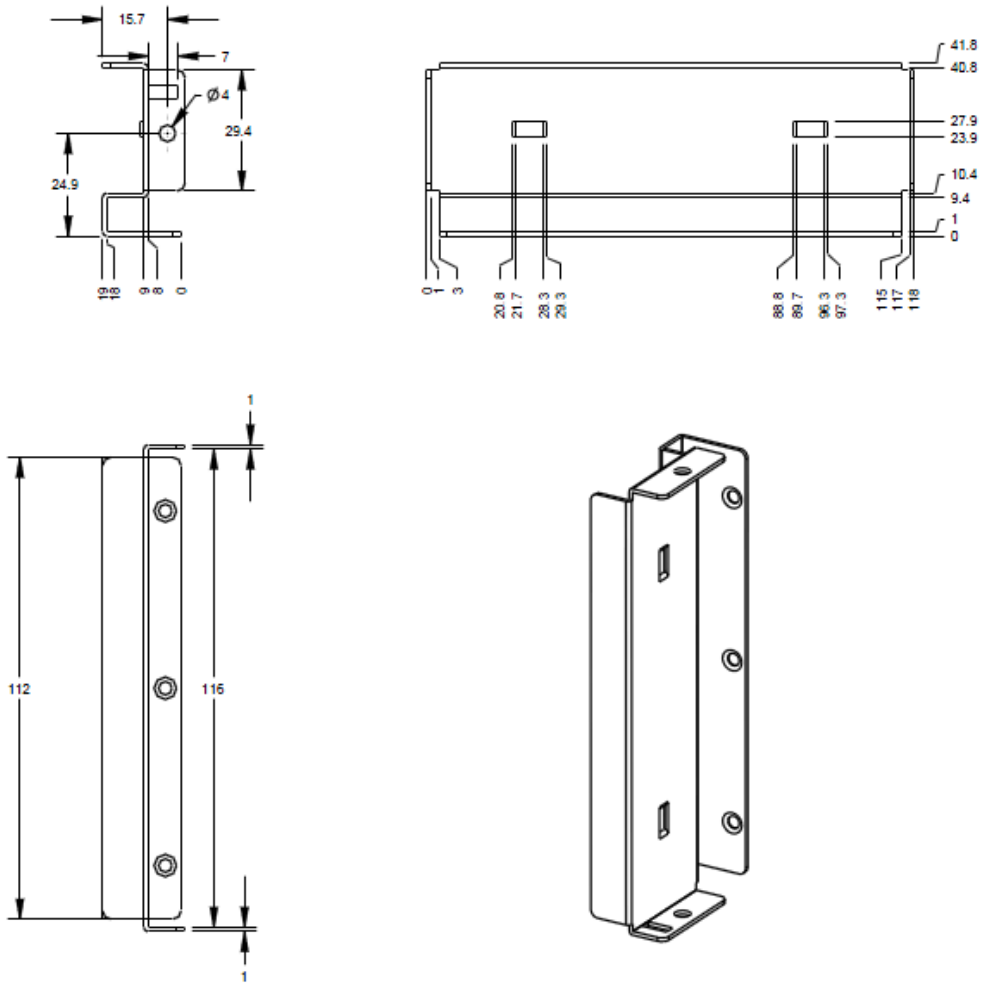


➤ Location of Lock Hole on the Pluggable Module



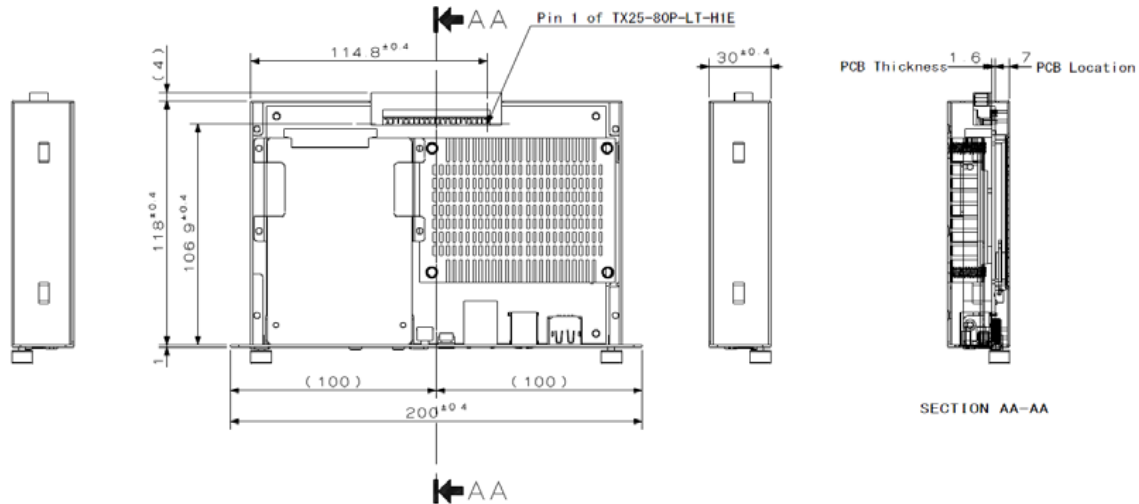
*The drawing is base on Intel[®] Open Pluggable Specification.

➤ Dimensions of the Guide Rail



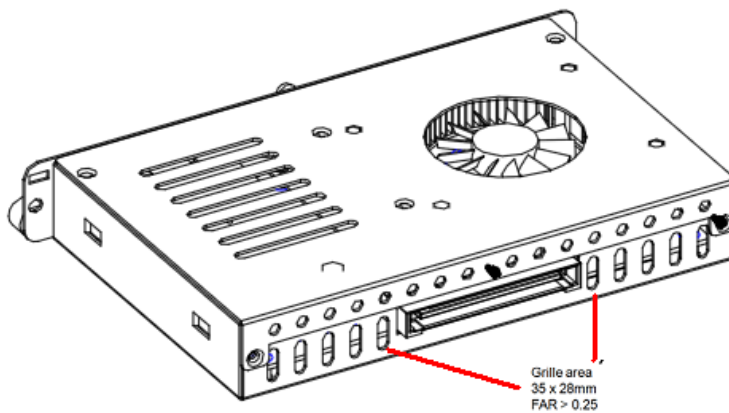
➤ Location of JAE TX25 Plug Connector

Please refer to the following drawing for location of the JAE TX25 plug connector. Pin 1 of the connector is located at 114.8 mm from the edge of the module, and 106.9 mm from the inner side of the front panel. For mating tolerance of TX25 plug connector and TX24 receptacle connector, please refer to the JAE specification



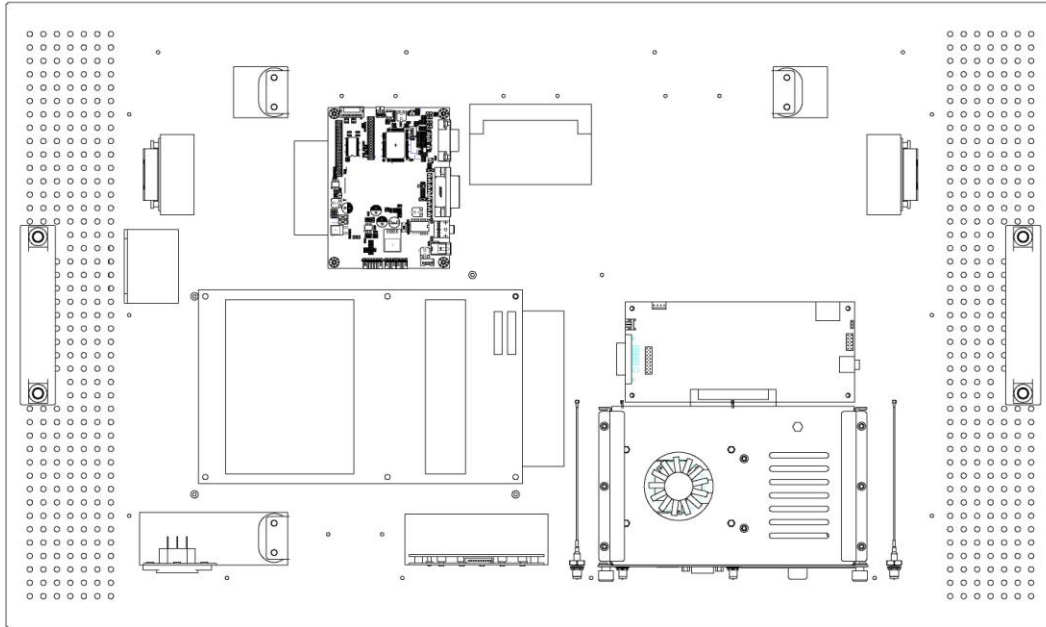
➤ Vent Holes at the Pluggable Module Back Panel

On the OPS830 Module, it is recommended by Intel that some vent holes be opened at the back so that hot air can escape more easily from the module that the FAR in on both sides of the module back panel should be greater than 0.25.



1.3.4 Reference Design

Display Panel Rear View – Internal



The digital signage OPS830 prototype is based on a 32" display panel with the functional blocks illustrated in Figure 18. It is mainly a 3-board partitioning design consisting of the pluggable module, docking board and the panel control board.

1.4 Package List

When you receive the OPS830, the bundled package should contain the following items:

- OPS830 device x 1
- Driver CD x 1
- HDD Mylar x 1
- THERMAL GREASE(Syringe 1G)
- M3 x 4 screw x 2
- M4 x 6 screw x 2

If you can not find the package or any items are missing, please contact Axiomtek distributors immediately.

CHAPTER 2

HARDWARE INSTALLATION

The OPS830 are convenient for your various hardware configurations, such as HDD (Hard Disk Drive), Memory Module.

The chapter 2 will show you how to install the hardware. It includes:

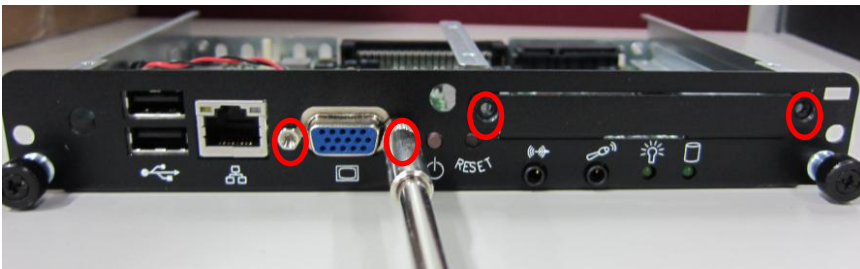
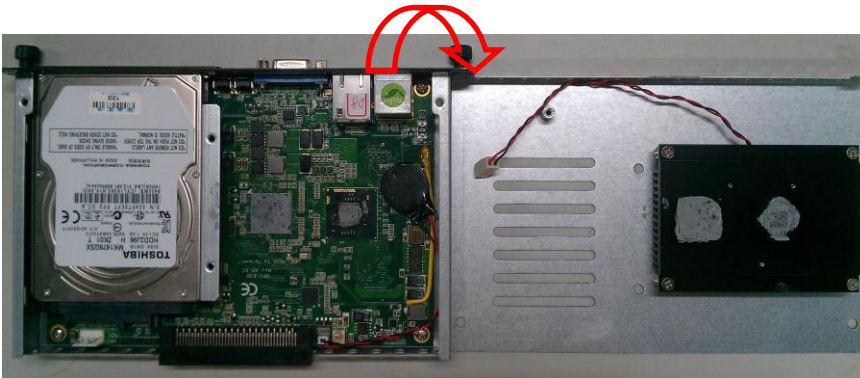
- Hard disk drive and DRAM Installation
- Pluggable Module Method

2.1 HDD,DRAM,Wireless Installation

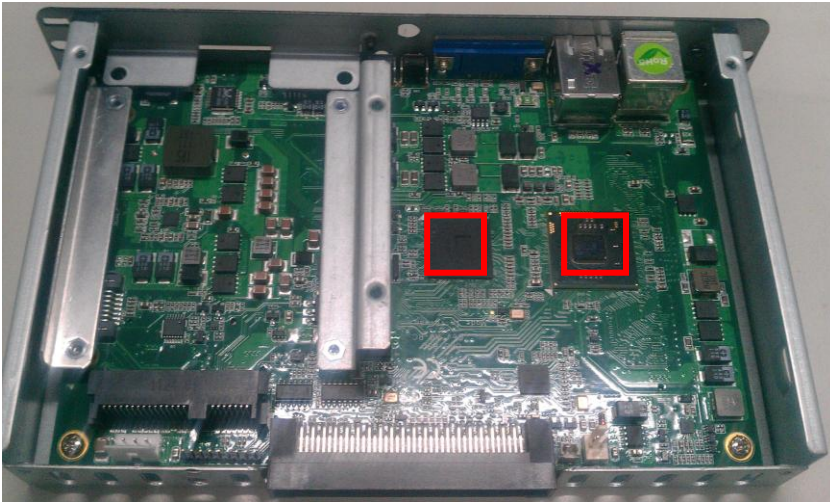
The OPS830 Series offers a convenient drive bay module for users to install DRAM and HDD. Please follow the steps:

Step 1 Turn off the system, and loosen the screws as illustrated.





NOTE: Please be reminded to smear the grease over the PCH and upper side of CPU



Step 2 Install DRAM

Step 2.1 Loosen the screws on the rear of chassis as illustrated.



Step 2.2 After losing the screws, extract the real of chassis out of the module.



Step 2.3 Install DRAM module.

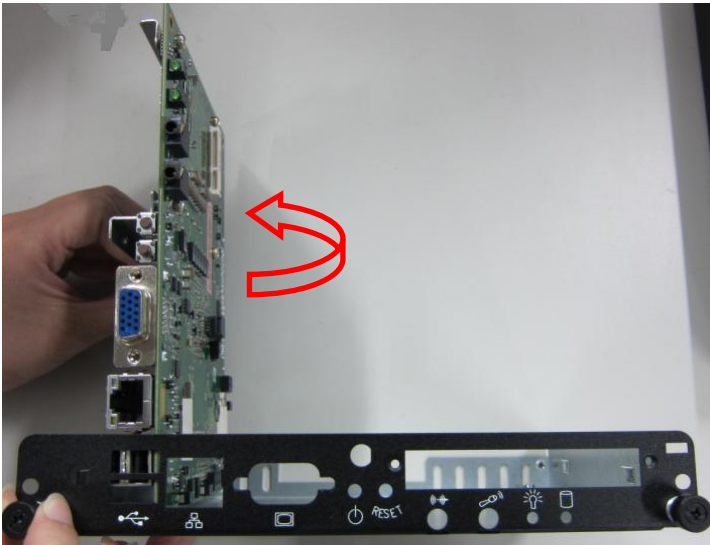
Put DRAM. Place the memory module into the socket and press it firmly. The socket latches are levered upwards and clipped on to the edges of the DIMM.



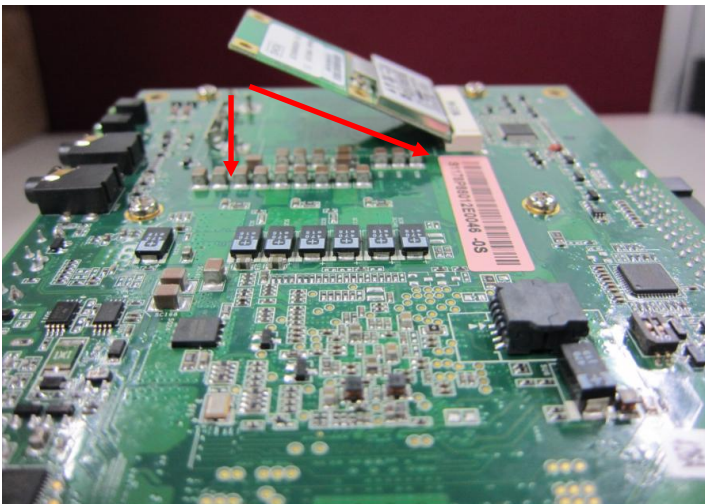
Step 3 Install Wireless Module

The OPS830 provides one Mini card slot for user to install one wireless LAN card. When installing the wireless LAN card, refer to the following instructions and illustration

Step 3.1 Please refer to Step 1 to loosen the screws of the chassis and PCB board. Turn over the PCB board

**Step 3.2**

Install Wi-Fi module. Place the Wi-Fi module into the socket and press it firmly down until it is fully located.



Step 3.3

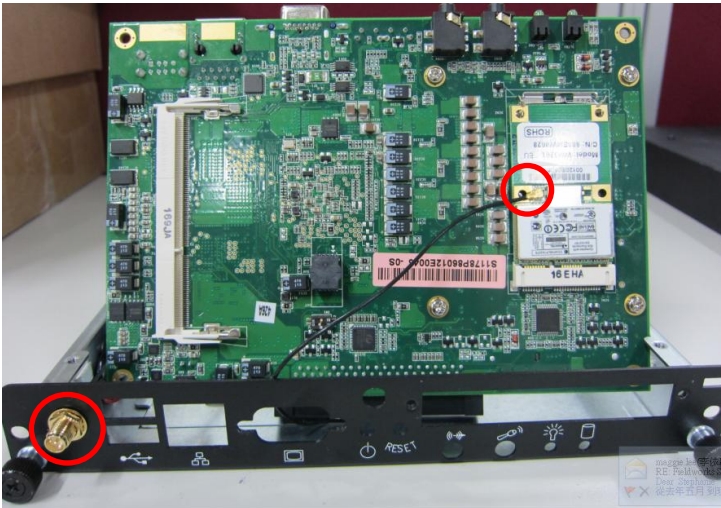
Paste the thermal pad on the Wi-Fi module and press it firmly.



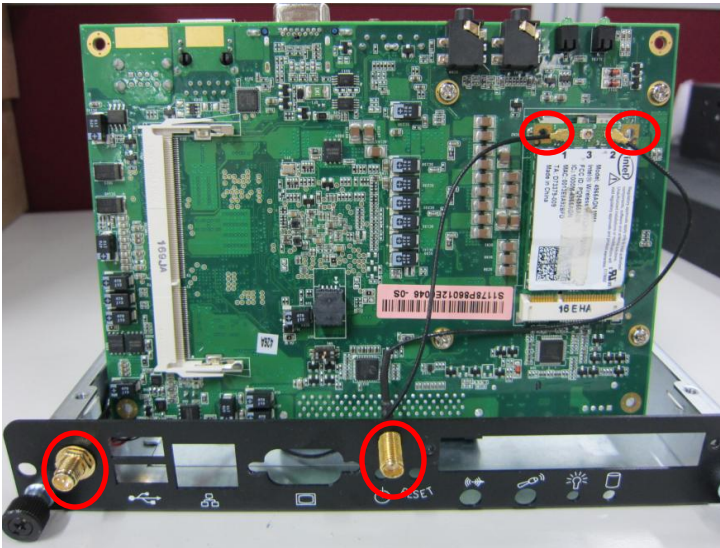
Step 3.4

Find the Antenna cable and connect it wireless LAN card.
Screw the antenna connector at expansion I/O side and Install the antenna on the wireless LAN card

➤ The wireless Module with one antenna application:



- The wireless module with two antennas application:



Step 4 Install HDD

To enable future remove of HDD, please affix the HDD Mylar sheet to the hard disk drive so that it extends past the length of the HDD at the opposite end of the HDD to the Connector

Step 4.1 Loosen the screw of HDD cover



Step 4.2 Affix the HDD Mylar sheet to the hard disk drive



Step 4.3 Plug HDD into hard disk drive connector



Step 4.4 Pull the HDD Mylar to slot-out the hard disk drive

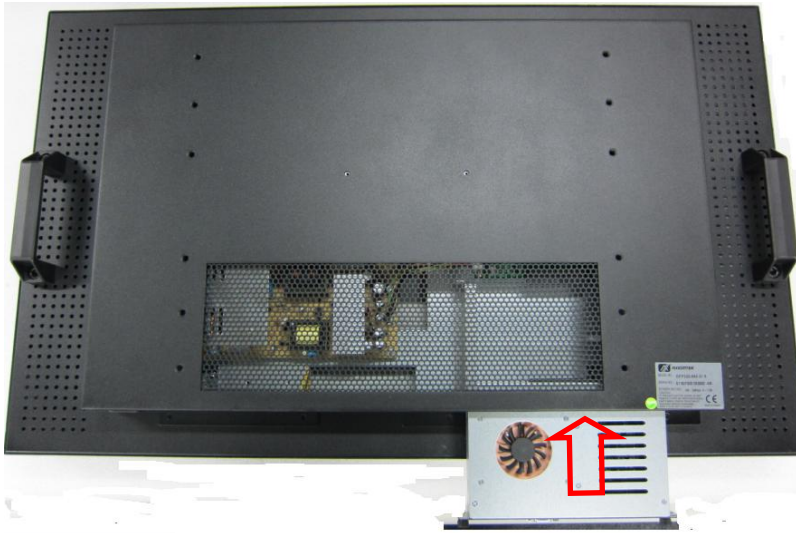


2.2 Pluggable Module Method



NOTE: Please contact Axiomatic for the available option display

Step 1 Pluggable the box into display



Step 2 Fasten the screws as illustrated



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CHAPTER 3 CONNECTORS

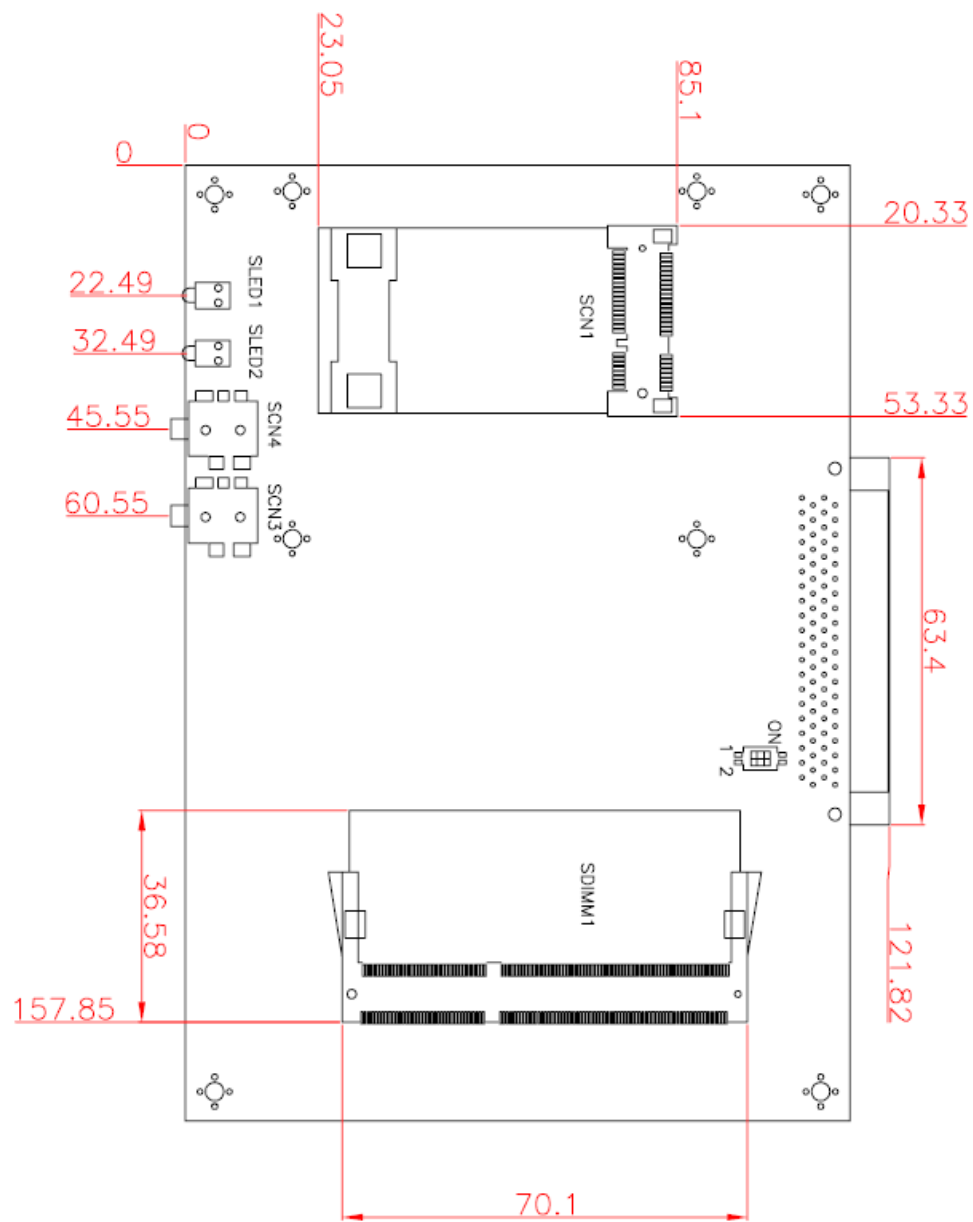
This chapter provides users with detailed description how to set up basic system configuration through the AMIBIOS8 BIOS setup utility.

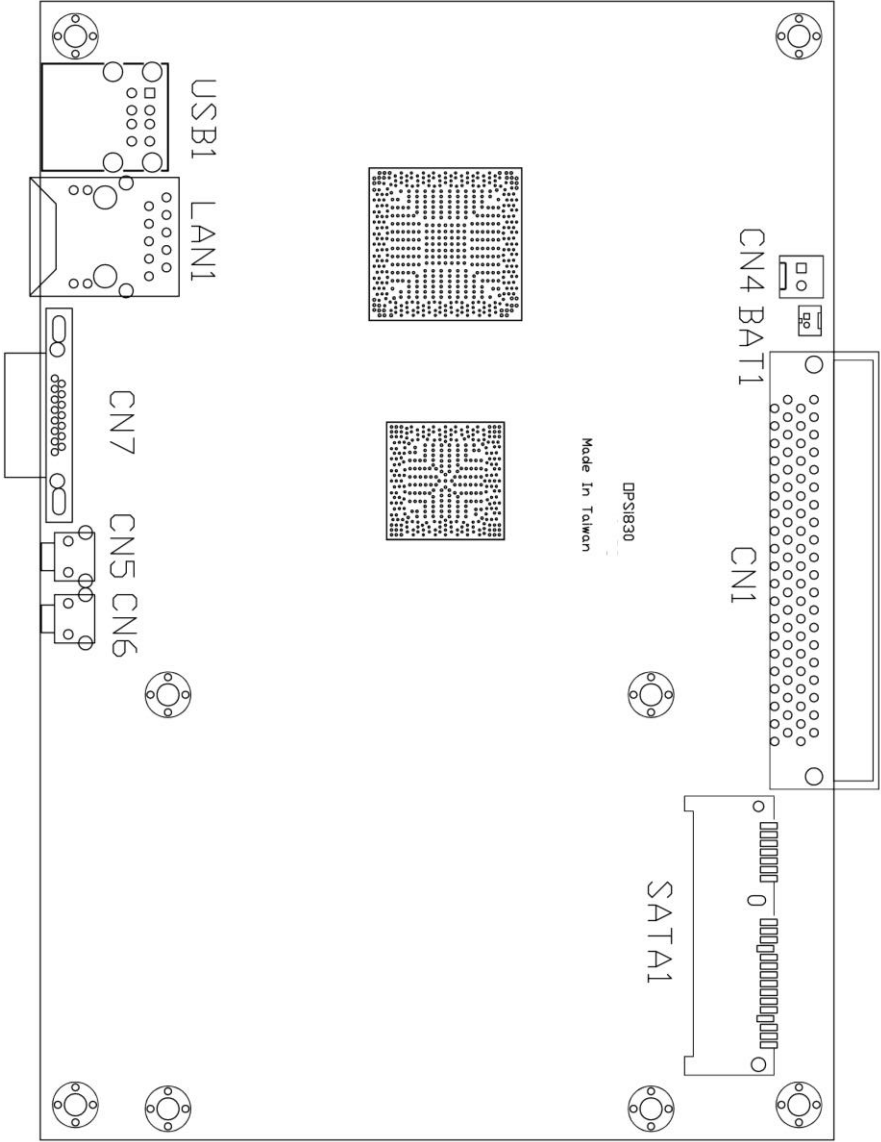
3.1 Connectors

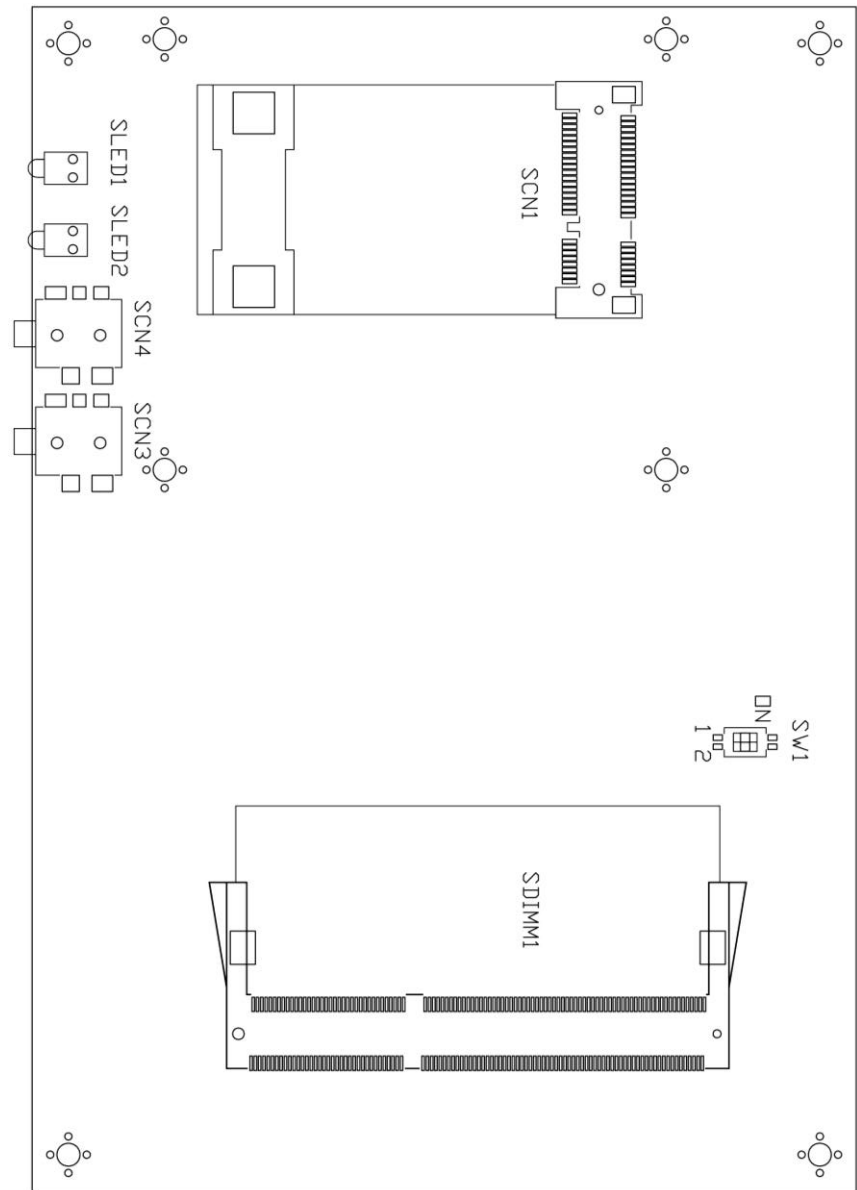
Connectors connect this board with other parts of the system. Loose or improper connection might cause problems. Make sure all connectors are properly and firmly connected.

Here is a summary table shows you all connectors on the board.

Connector	Description
CN1	JAE TX25 Connector
CN4	CPU FAN
CN5	POWER BUTTON
CN6	RESET BUTTON
CN7	VGA Connector
SCN1	PCI-Express Mini Card Connector
SCN3	Audio LINE-OUT Connector
SCN4	Audio MIC-IN Connector
BAT1	Battery Connector
LAN1	Ethernet Port
USB1	USB Port 0/1
SLED1	HDD LED
SLED2	Power LED
SDIMM1	DDRIII SO-DIMM Connector

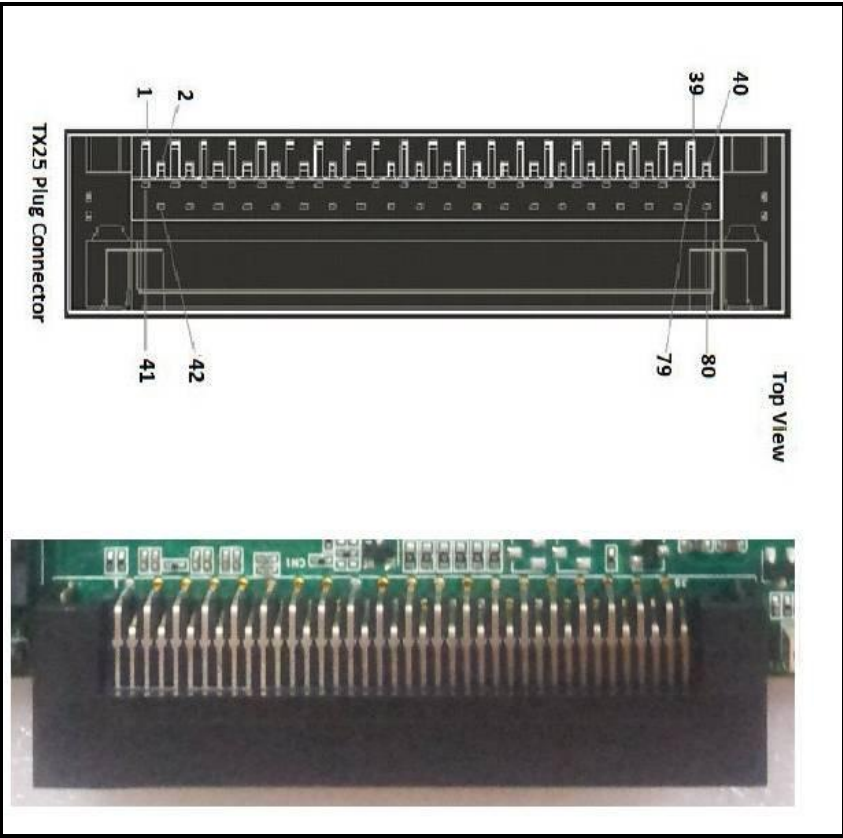






3.1.1 JAE TX25 Connector (CN1)

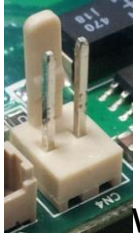
Pin	Signal	Pin	Signal	Pin	Signal
1	DDP_3N	2	DDP_3P	3	GND
4	DDP_2N	5	DDP_2P	6	GND
7	DDP_1N	8	DDP_1P	9	GND
10	DDP_0N	11	DDP_0P	12	GND
13	DDP_AUXN	14	DDP_AUXP	15	DDP_HPD
16	GND	17	TMDS_CLK-	18	TMDS_CLK+
19	GND	20	TMDS0-	21	TMDS0+
22	GND	23	TMDS1-	24	TMDS1+
25	GND	26	TMDS2-	27	TMDS2+
28	GND	29	DVI_DDC_DATA	30	DVI_DDC_CLK
31	DVI_HPD	32	GND	33	+12V~+19V
34	+12V~+19V	35	+12V~+19V	36	+12V~+19V
37	+12V~+19V	38	+12V~+19V	39	+12V~+19V
40	+12V~+19V	41	NC	42	NC
43	NC	44	NC	45	NC
46	NC	47	NC	48	NC
49	NC	50	SYS_FAN_CTL	51	UART_RXD
52	UART_TXD	53	GND	54	NC
55	NC	56	GND	57	NC
58	NC	59	GND	60	USB_PN2
61	USB_PP2	62	GND	63	USB_PN1
64	USB_PP1	65	GND	66	USB_PN0
67	USB_PP0	68	GND	69	LINEOUT_L
70	LINEOUT_R	71	NC	72	PB_DET
73	PS_ON#	74	NC	75	GND
76	GND	77	GND	78	GND
79	GND	80	GND		



3.1.2 CPU FAN (CN4)

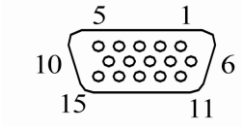

The CN4 is a CPU fan interface

Pin	Description	
1	GND	
2	+5V	



3.1.3 VGA Port (CN7)

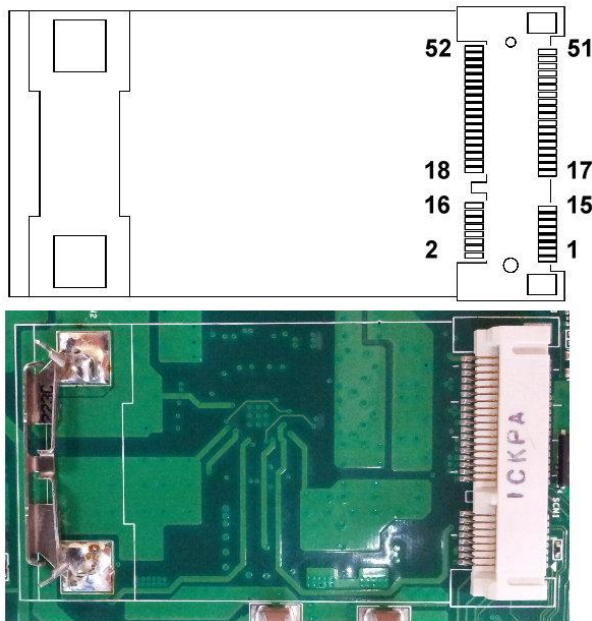
DB15 CRT Connector (CN7) Co-layout with CN4
CN7 is a DB15 connector commonly used for the CRT Monitor.

Pin	Signal	Pin	Signal
1	Red	2	Green
3	Blue	4	N.C.
5	GND	6	DETECT
7	GND	8	GND
9	VCC	10	GND
11	N.C.	12	DDC DATA
13	Horizontal Sync	14	Vertical Sync
15 DDC CLK			
<div><div></div><div></div></div>			

3.1.4 PCI-Express Mini Card Connector (SCN1)

The SCN1 is a PCI-Express Mini Card connector which supports a PCI-Express x1 link and a USB 2.0 link. A PCI-Express Mini Card can be applied to either PCI-Express or USB 2.0. It complies with PCI-Express Mini Card spec v1.2.

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3VSB
3	No use	4	GND
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	GND	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	W_DISABLE#
21	GND	22	PERST#
23	PE_RXN3	24	+3.3VSB
25	PE_RXP3	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PE_TXN3	32	SMB_DATA
33	PE_TXP3	34	GND
35	GND	36	USB_D8-
37	GND	38	USB_D8+
39	+3.3VSB	40	GND
41	+3.3VSB	42	No use
43	GND	44	No use
45	No use	46	No use
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3VSB



3.1.5 Ethernet Ports (LAN1)

The RJ-45 connector LAN1 is for Ethernet. To connect the board to 100-Base-T or 1000-Base-T hub, just plug one end of the cable into LAN1 and connect the other end (phone jack) to a 100-Base-T hub or 1000-Base-T hub.

Pin	Signal	Pin	Signal
L1	MDI0+	L5	MDI2+
L2	MDI0-	L6	MDI2-
L3	MDI1+	L7	MDI3+
L4	MDI1-	L8	MDI3-
A	Active LED (Yellow)		
B	100 LAN LED (Green)/1000 LAN LED (Orange)		

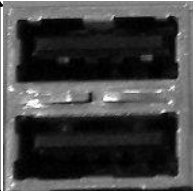
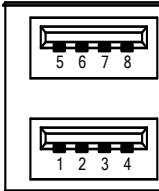
A

B

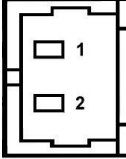

3.1.6 USB Connector (USB1)

The board features Universal Serial Bus (USB) connectors, compliant with USB 2.0 (480Mbps) that can be adapted to any USB peripherals, such as monitor, keyboard and mouse. This USB1 connector carries USB port 0 and 1

Pin	USB Port 0	Pin	USB Port 1
1	USB VCC (+5V standby power)	5	USB VCC (+5V standby power)
2	USB #0_D-	6	USB #1_D-
3	USB #0_D+	7	USB #1_D+
4	GND	8	GND



3.1.7 CMOS battery (BAT1)

Pin	Signal	 
1	+VBAT	
2	GND	

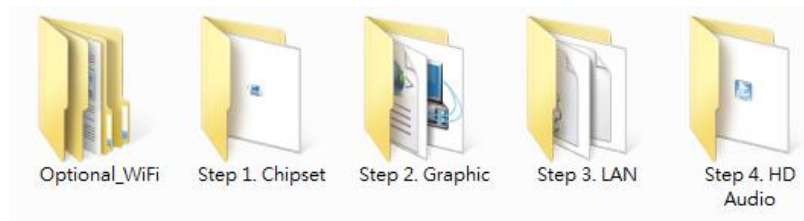
CHAPTER 4

DRIVERS INSTALLATION

4.1 System

OPS830 supports Window 7. To facilitate the installation of system driver, please carefully read the instructions in this chapter before start installing.

1. Insert Intel Express Installer Driver CD and select the “\Driver\”.
2. Select your operating system driver to install.



3. Select all files and follow the installing procedure.
- You may also link to www.axiomtek.com for more information.

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CHAPTER 5

AMI BIOS SETUP UTILITY

This chapter provides users with detailed description how to set up basic system configuration through the AMIBIOS8 BIOS setup utility.

5.1 Starting

To enter the setup screens, follow the steps below:

- Turn on the computer and press the <F2> key immediately.
- After you press the <F2> key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Chipset and Power menus.

5.2 Navigation Keys

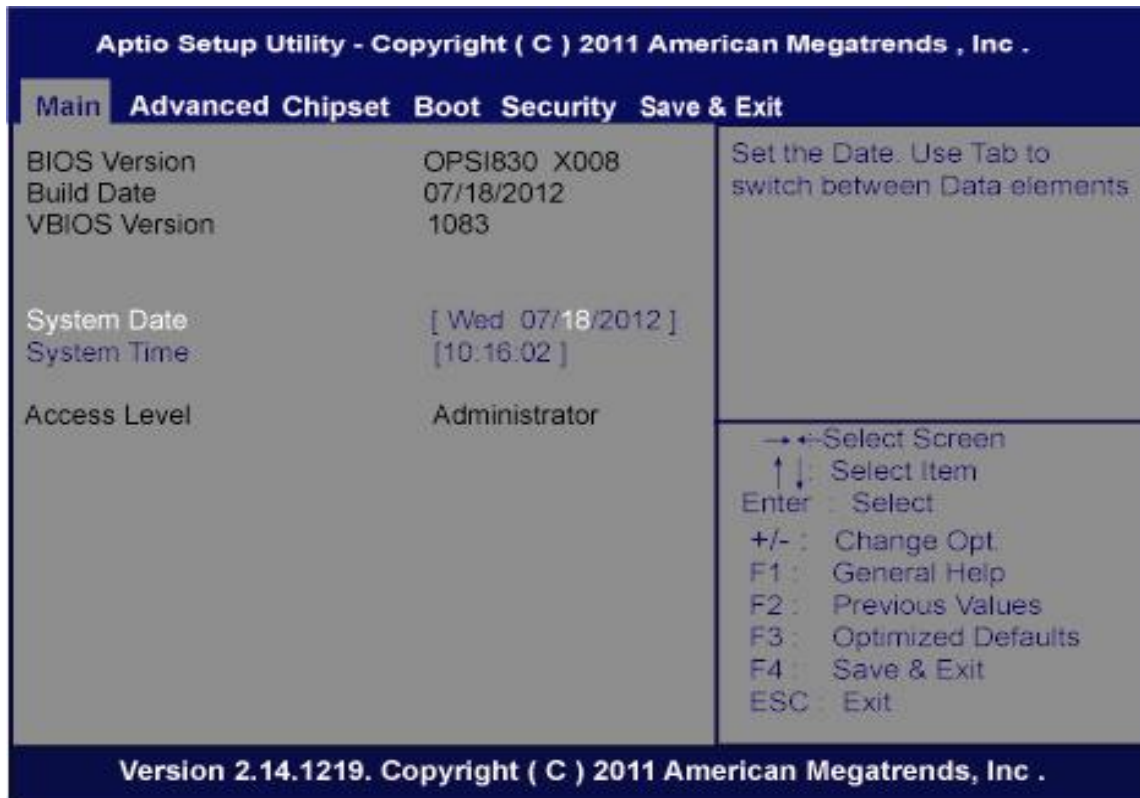
The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

 **NOTE:** Some of navigation keys differ from one screen to another.

← Left/Right	The Left <Arrow> keys allow you to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow you to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
Tab	The <Tab> key allows you to select setup fields.
F1	The <F1> key allows you to display the General Help screen.
F2	The <F2> key allows you to Load Previous Values.
F3	The <F3> key allows you to Load Optimized Defaults.
F4	The <F4> key allows you to save any changes you have made and exit Setup. Press the <F4> key to save your changes.
Esc	The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving your changes.
Enter	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens.

5.3 Main Menu

When you first enter the Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.



➤ **System Date/Time**

Use this option to change the system date and time. Highlight System Date or System Time using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Enter> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

5.4 Advanced Menu

- **Launch PXE OpROM**

Use this item to enable or disable the Boot ROM function of the onboard LAN chip when the system boots up.

- **Launch Storage OpROM**

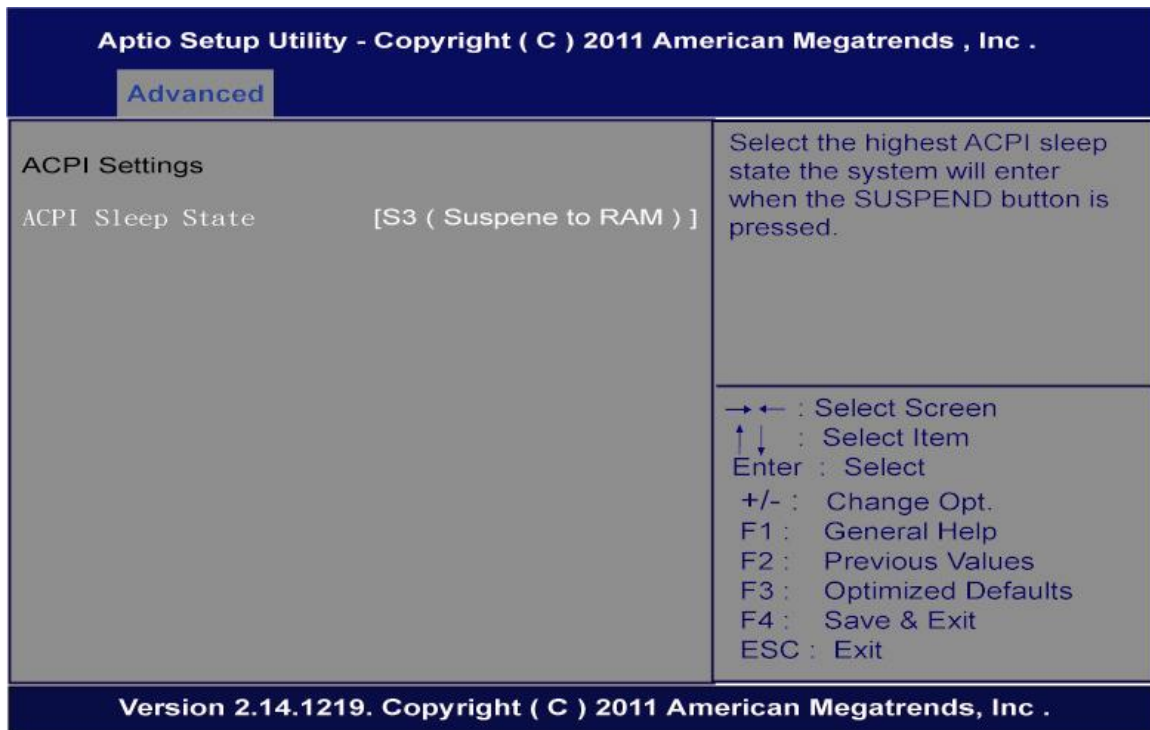
This item can set enable or disable the storage device option ROM with CF device. The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

- **ACPI Settings**
- **S5 RTC Wake Settings**
- **CPU Configuration**
- **SATA Configuration**
- **IDE Configuration**
- **USB Configuration**
- **F81801 Super IO Configuration**
- **F81801H/W Monitor**

For items marked with “▶”, please press <Enter> for more options.

- **ACPI Settings**

You can use this screen to select options for the ACPI Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

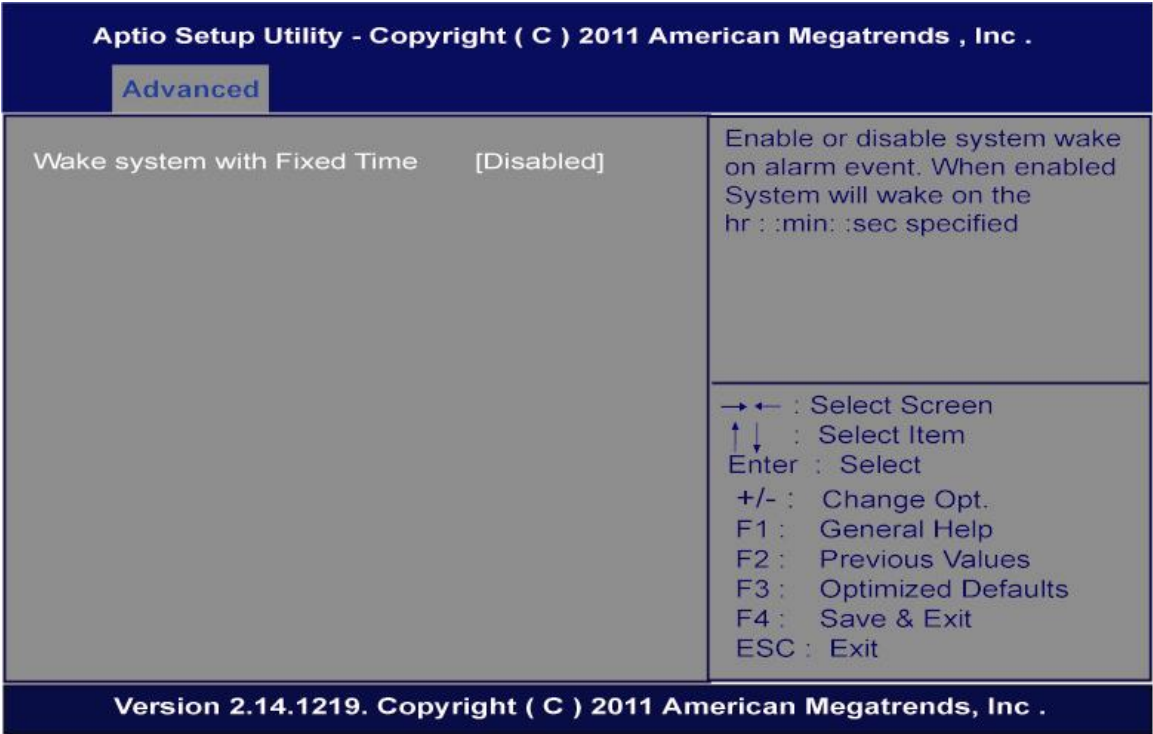


- **ACPI Sleep State**

Allow you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend. Here are the options for your selection, S1 (CPU Stop Clock), S3 (Suspend to RAM) and Suspend Disable.

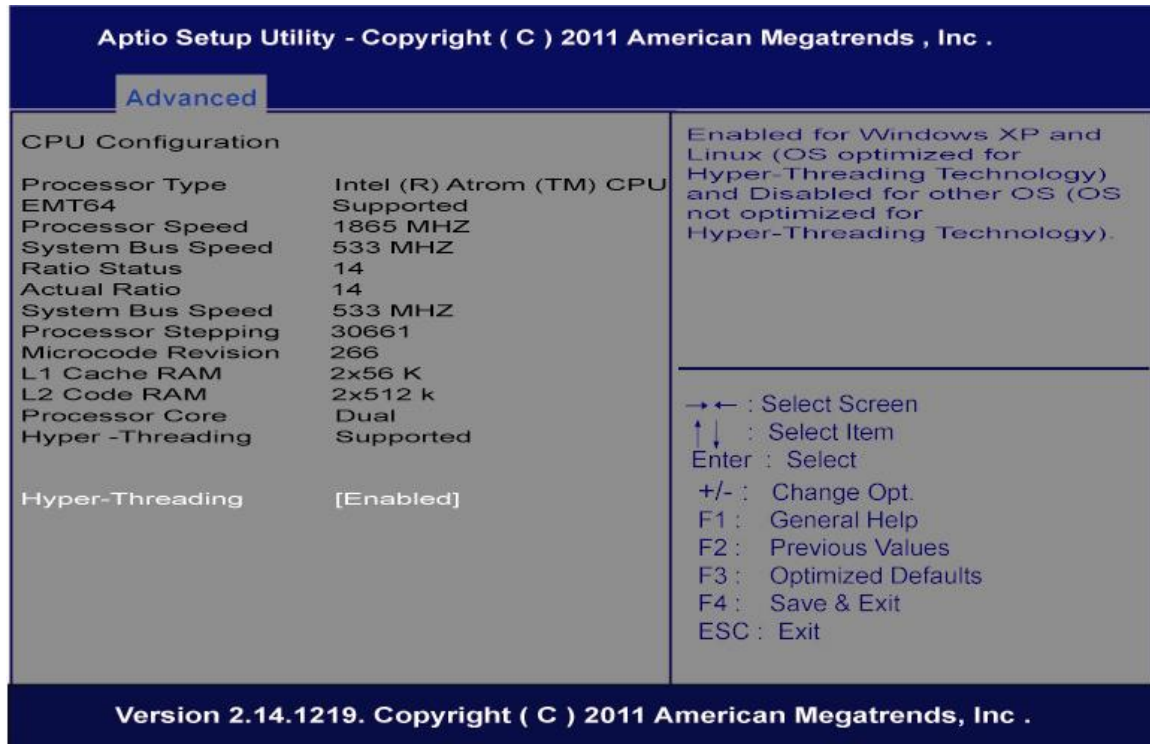
● **S5 RTC Wake Settings**

This function is to enable or disable system wake on alarm event. When it is enabled, system will wake on the hr.:min.:sec specified



● CPU Configuration

This screen shows the CPU Configuration, and you can change the value of the selected option.



➤ Hyper-Threading

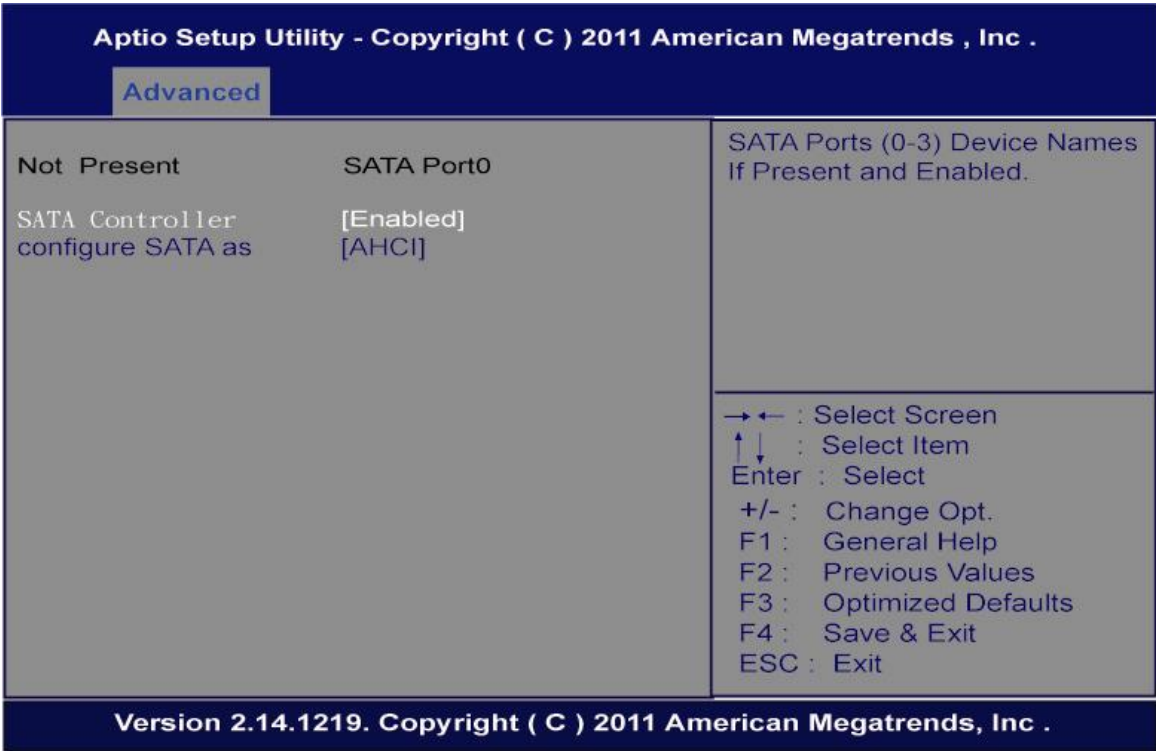
This feature is to enable and disable hyper-threading function.

➤ Execute Disable Bit

Execute Disable Bit is a hardware-based security feature that can reduce exposure to viruses and malicious-code attacks and prevent harmful software from executing and propagating on the server or network.

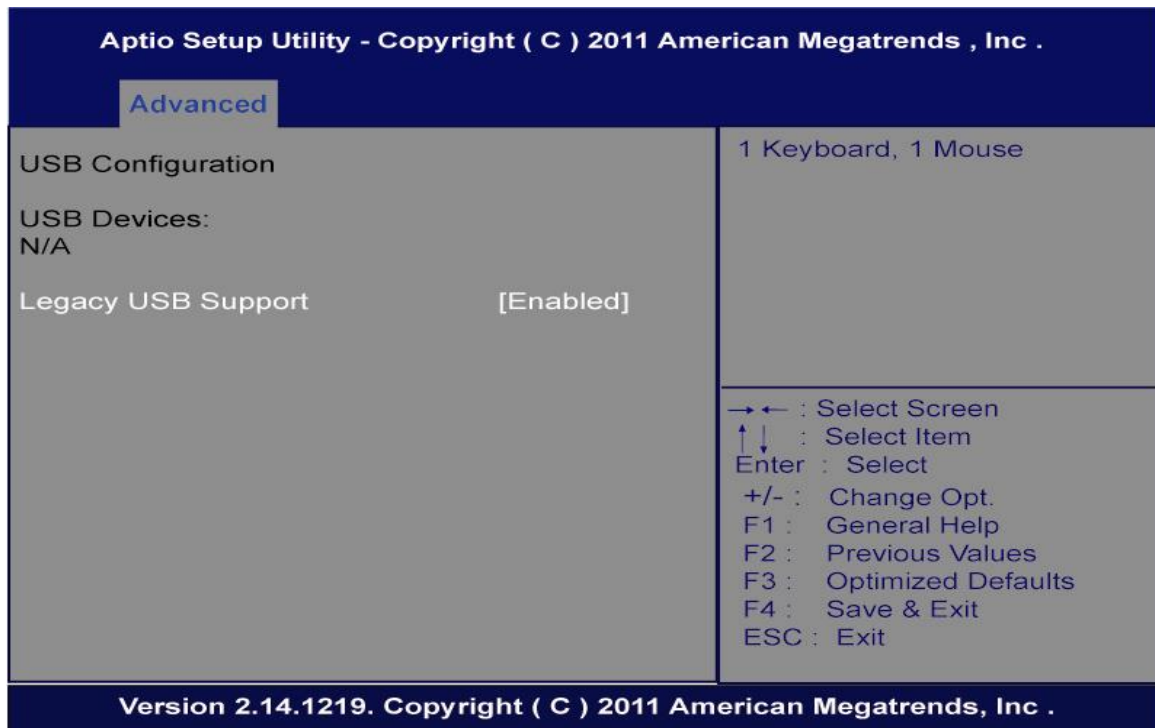
● IDE Configuration

This function is the SATA Ports device names if present and enabled.



- **USB Configuration**

You can use this screen to select options for the USB Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

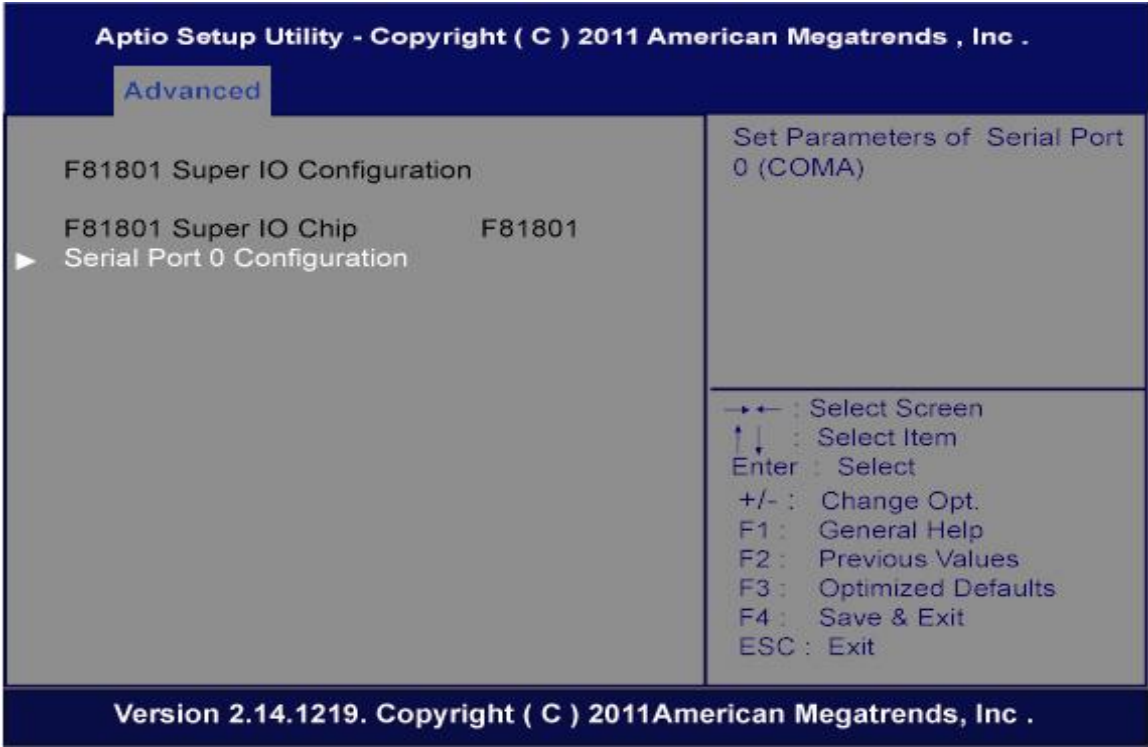


- **Legacy USB Support**

This is for supporting USB device under legacy OS such DOS, when choosing "AUTO", the system will automatically detect any USB device is plugged into the computer and enable USB legacy mode when a USB device plugged and disable USB legacy mode when no USB device is plugged.

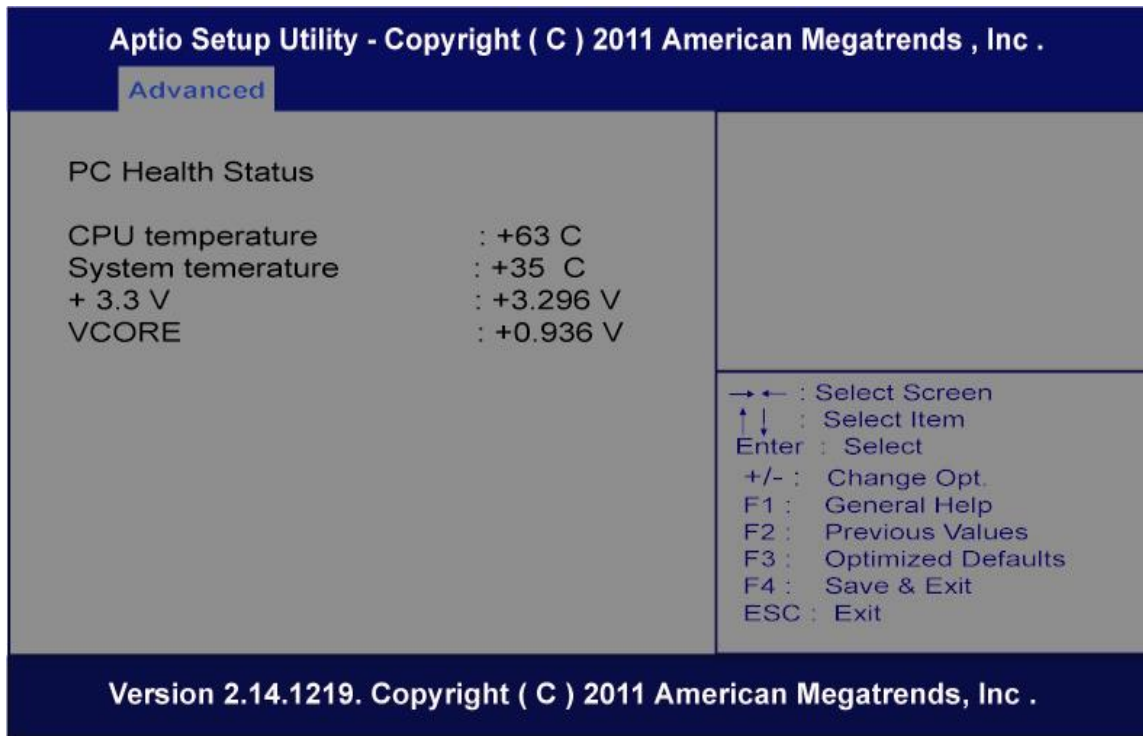
● **F810801 Super IO Configuration**

This is set parameters of serial port 0.

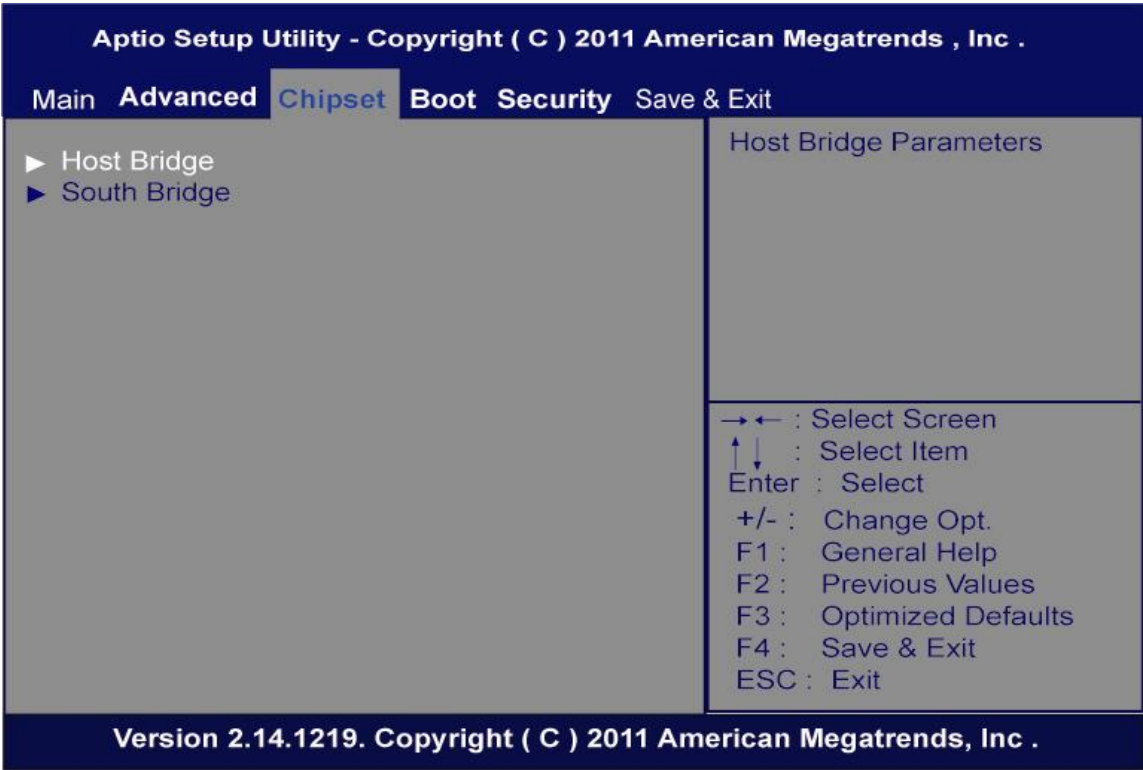


- **F810801 H/W Monitor**

This screen shows the Hardware Health Configuration, and a description of the selected item appears on the right side of the screen



5.5 Chipset Menu

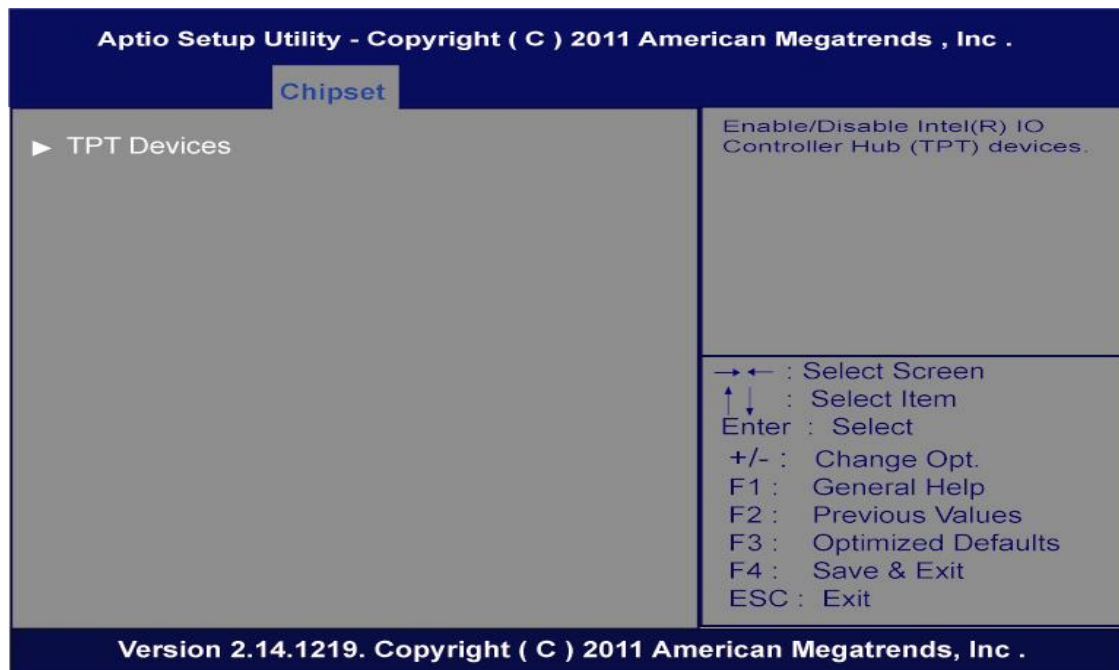
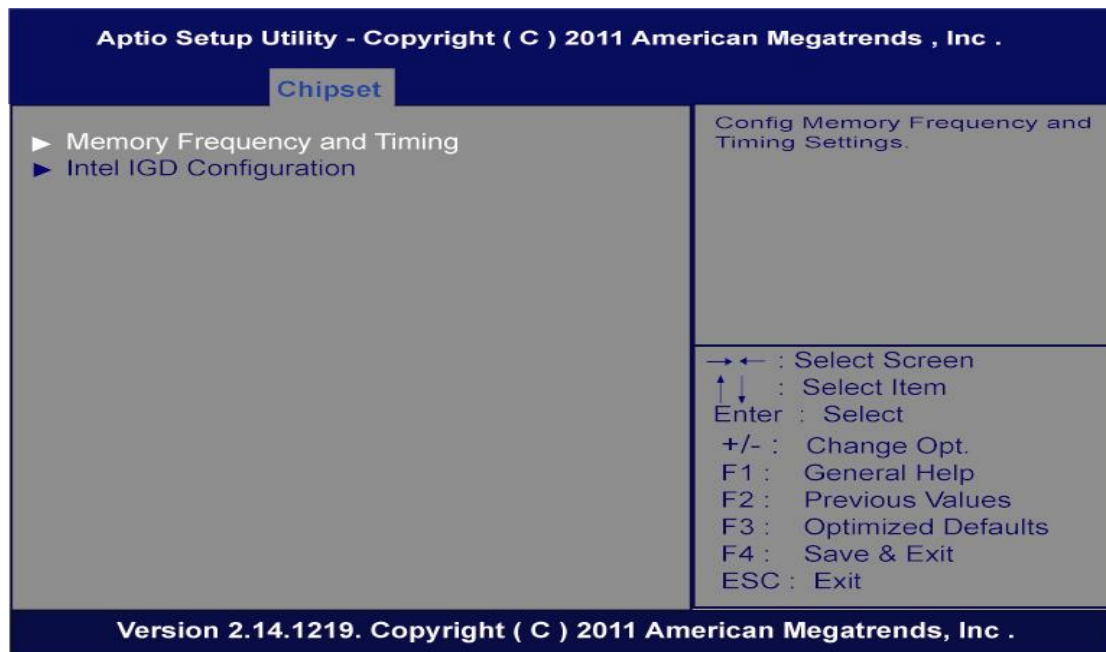


- **Host Bridge**

This feature is to consign memory frequency and timing settings.

- **South Bridge**

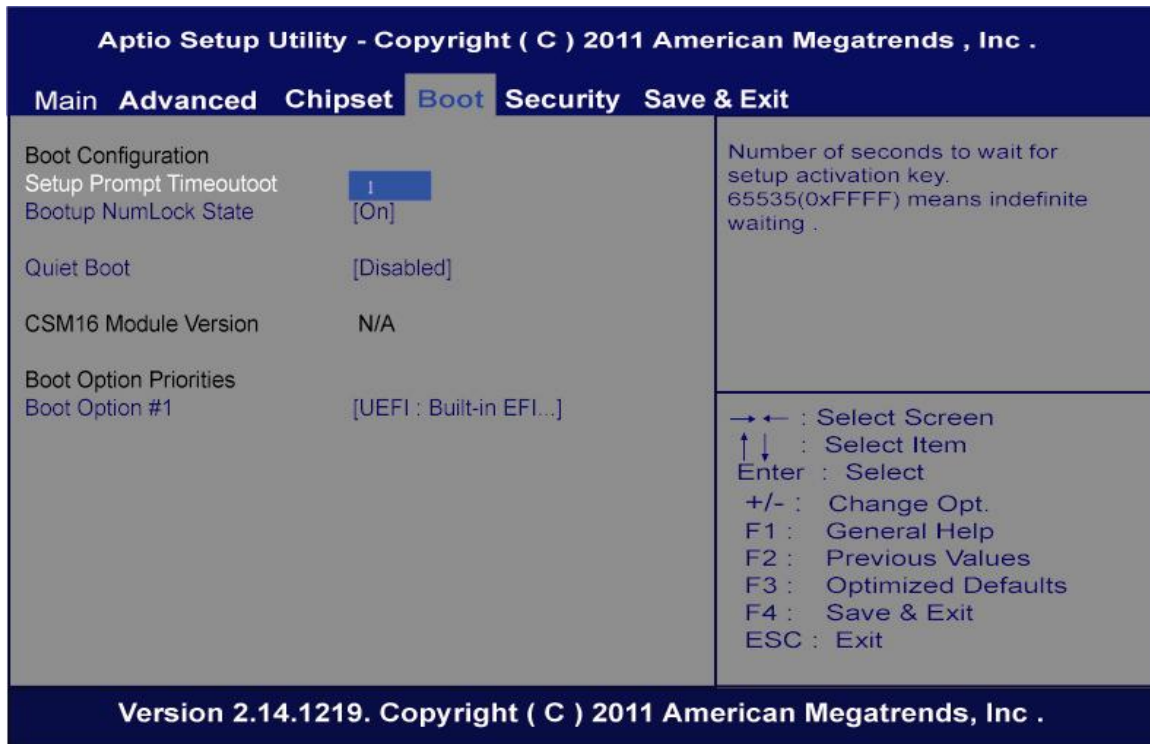
This feature is to enable and disable Intel IO controller Hub(TPT) devices



5.6 Boot Menu

The Boot menu allows users to change boot options of the system. You can select any of the items in the left frame of the screen to go to the sub menus:

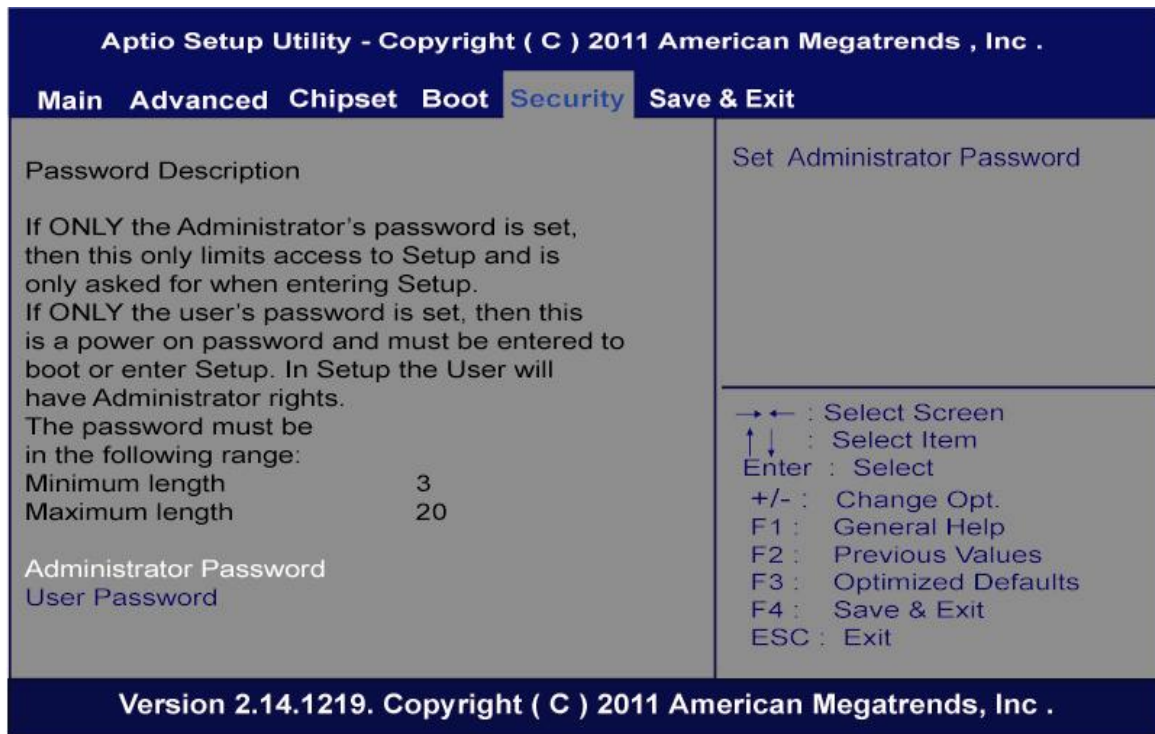
- **Setup Prompt Timeout**
- **Boot up Mum Lock State**
- **Quiet Boot**
- **CSM16 Module Version**
- **Boot Option Priorities**



- **Setup Prompt Timeout**
Set the Timeout for wait press key to enter Setup Menu
- **Boot up Mum Lock State**
Use this item to select the power-on state for the Mum Lock. The default setting is on.
- **Quiet Boot**
Use this item to enable or disable the Quite Boot state. The default setting is disabling.
- **Boot Option #1**

5.7 Security Menu

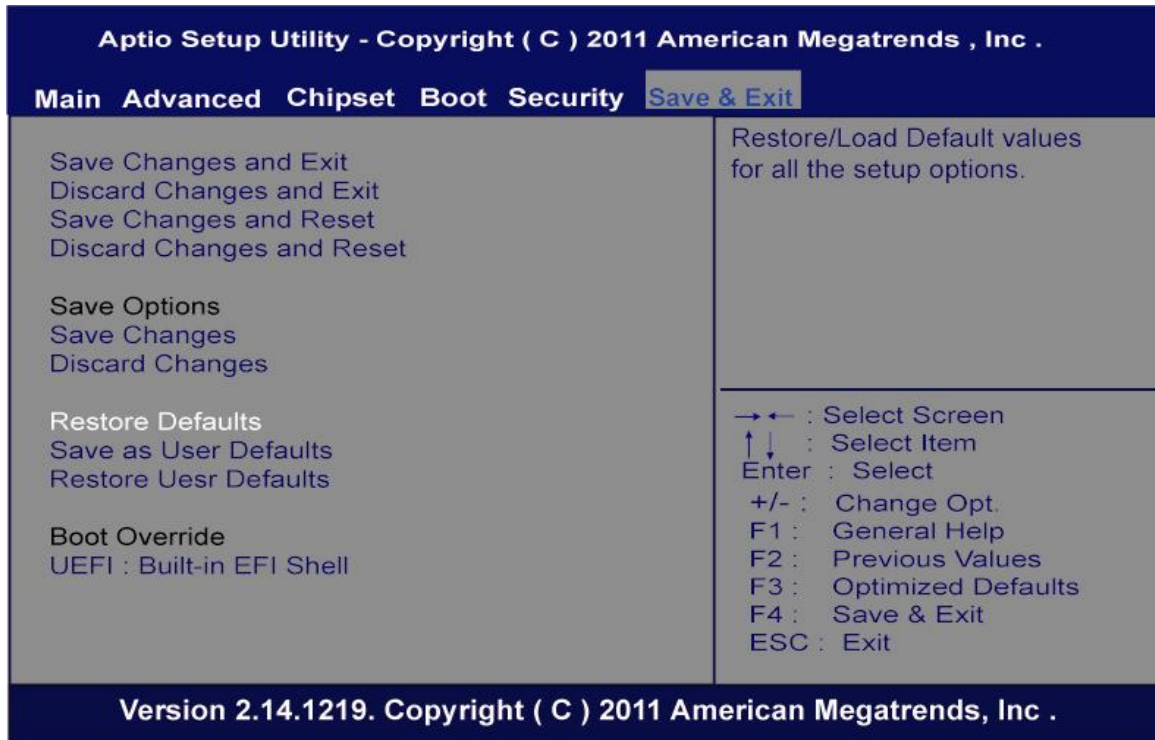
The Security menu allows users to change the security settings for the system.



- **Administrator Password**
This item indicates whether an administrator password has been set. If the password has been installed, Installed displays. If not, Not Installed displays.
- **User Password**
This item indicates whether a user password has been set. If the password has been installed, Installed displays. If not, Not Installed displays.

5.8 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or failsafe default values.



- **Save Changes and Exit**
When you have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.
- **Discard Changes and Exit**
Select this option to quit Setup without making any permanent changes to the system configuration and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.
- **Save Changes and Reset**
When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.
- **Discard Changes and Reset**
Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.

- **Save Changes**
When you have completed the system configuration changes, select this option to save changes. Select **Save Changes** from the **Save & Exit** menu and press <Enter>. Select **Yes** to save changes.
- **Discard Changes**
Select this option to quit Setup without making any permanent changes to the system configuration. Select *Discard Changes* from the **Save & Exit** menu and press <Enter>. Select **Yes** to discard changes.
- **Restore Defaults**
It automatically sets all Setup options to a complete set of default settings when you select this option. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Setup options if your computer is experiencing system configuration problems. Select **Restore Defaults** from the **save & Exit** menu and press <Enter>.
- **Save as User Defaults**
- **Restore User Default**
- **UEFI: Built-in EFI Shell**

This function is use EFI shell to boot up the system.

APPENDIX A

REFERENCE DOCUMENTS

Document	Document No./Location
Digital Signage Open Pluggable Specification	324427
JAE TX24/TX25 connector product brief	http://iae-connectors.com/en/pdf/2008-40-TX24TX25.pdf
JAE plug connector details and drawing	http://iae-connectors.com/en/product_en.cfm?l_code=EN&series_code=TX24/TX25&product_number=TX25-80P-LT-H1E
JAE receptacle connector details and drawing	http://iae-connectors.com/en/product_en.cfm?l_code=EN&series_code=TX24/TX25&product_number=TX24-80R-LT-H1E

MEMO

APPENDIX B

WATCH DOG TIMER

About Watchdog Timer

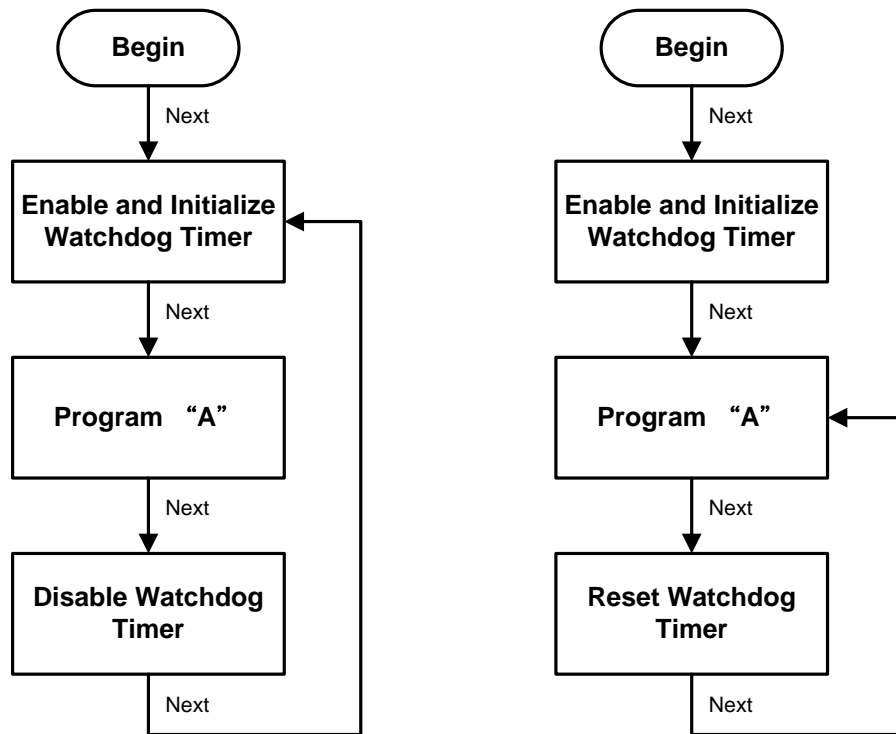
Software stability is major issue in most application. Some embedded systems are not watched by human for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solution.

The watchdog timer is a counter that triggers a system reset when it counts down to zero from a preset value. The software starts counter with an initial value and must reset it periodically. If the counter ever reaches zero which means the software has crashed, the system will reboot.

How to Use Watchdog Timer

The I/O port base addresses of watchdog timer are 2E (hex) and 2F (hex). The 2E (hex) and 2F (hex) are address and data port respectively.

Assume that program A is put in a loop that must execute at least once every 10ms. Initialize watchdog timer with a value bigger than 10ms. If the software has no problems; watchdog timer will never expire because software will always restart the counter before it reaches zero.



Sample Program

Assembly sample code :

;Enable WDT:

```
mov    dx,2Eh
mov    al,87          ;Un-lock super I/O
out    dx,al
out    dx,al
```

;Select Logic device:

```
mov    dx,2Eh
mov    al,07h
out    dx,al
mov    dx,2Fh
mov    al,07h
out    dx,al
```

;WDT Device Enable:


```
mov dx,2Eh
mov al,2Bh
out dx,al
mov dx,2Fh
mov al,00h
out dx,al
```

```
mov dx,2Eh
mov al,30h
out dx,al
mov dx,2Fh
mov al,01h
out dx,al
```


;Activate WDT:

```
mov    dx,2Eh
mov    al,0F0h
out    dx,al
mov    dx,2Fh
mov    al,80h
out    dx,al
```

;Set Second or Minute :

```
mov    dx,2Eh
mov    al,0F5h
out    dx,al
mov    dx,2Fh
mov    al,Nh          ;N=71h or 79h(see below  Note)
out    dx,al
```

;Set base timer :

```
mov    dx,2Eh
mov    al,0F6h
out    dx,al
mov    dx,2Fh
mov    al,Mh          ;M=00h,01h,...FFh (hex), Value=0 to 255
out    dx,al          ;(see below  Note)
```

;Disable WDT:

```
mov    dx,2Eh
mov    al,30h
out    dx,al
mov    dx,2Fh
mov    al,00h          ;Can be disabled at any time
out    dx,al
```



Note:

If **N**=71h, the time base is set to second.

M = time value

- 00: Time-out Disable
- 01: Time-out occurs after 1 second
- 02: Time-out occurs after 2 seconds
- 03: Time-out occurs after 3 seconds

..

FFh: Time-out occurs after 255 seconds

If **N**=79h, the time base is set to minute.

M = time value

- 00: Time-out Disable
- 01: Time-out occurs after 1 minute
- 02: Time-out occurs after 2 minutes
- 03: Time-out occurs after 3 minutes
- FFh: Time-out occurs after 255 minutes